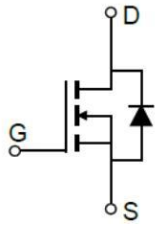
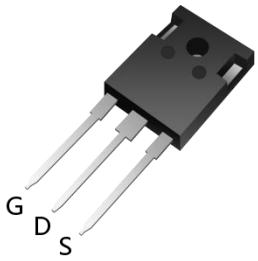
N-Channel Power MOSFET

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)}$	34	mΩ
I_D	80	A





TO-247-3

Features

- Low on-resistance
- Fast switching speed
- Parallel use is easy
- Ultra Low Gate Charge:Qg=172nC(Typ.)

Applications

- LED power supply
- Adapter/charger
- Smart home power supply

Absolute Maximum Ratings(Ta=25℃,unless otherwise noted)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	V
Drain Current - Continuous (T_C=25℃) (Note 1)	I_D	80	A
Drain Current -Continuous (T_C=100℃) (Note 1)		39	A
Drain Current - Pulsed (Note 1,2)	I_{DM}	248	A
Single Pulsed Avalanche Energy (Note 3)	E_{AS}	1656	mJ
MOSFET dv/dt ruggedness	dV/dT	40	V/ns
Reverse diode dv/dt		40	V/ns
Maximum diode commutation current	dI/dT	800	A/μs
Power Dissipation (T_C=25℃)	P_D	416	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	℃

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal resistance, junction – case. Max	R_{thJC}	0.3	℃/W
Thermal resistance, junction – ambient. Max	R_{thJA}	35	

Electrical Characteristics(TJ=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Units
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=1mA	650			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=650V, V_{GS}=0V, T_J=25℃			3.5	μA
		V_{DS}=650V, V_{GS}=0V, T_J=150℃		1000		
Gate Leakage Current	I_{GSS}	V_{GS}=±30V, V_{DS}=0V			±100	nA
Gate Threshold voltage	$V_{GS(TH)}$	V_{DS}=V_{GS}, I_D=3.3mA	3	4	4.5	V
Drain-Source on-state resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=33.1A		34	41	mΩ
Forward Transconductance	G_{fs}	V_{DS}=5V, I_D=25A		40		S
Input capacitance	C_{iss}	V_{DS}=100V, V_{GS}=0V, f=1MHz		6715		pF
Output capacitance	C_{oss}			245		pF
Reverse capacitance	C_{rss}			1.64		pF
Gate resistance	R_G	j=1MHz		1.8		Ω
Turn On Delay Time	$t_{d(on)}$	V_{DS}=400V, I_D= 40A, V_{GS}=10V, R_{GEN}=2.2Ω		28		ns
Rise Time	t_r			44		ns
Turn Off Delay Time	$t_{d(off)}$			106		ns
Fall Time	t_f			42		ns
Total Gate Charge	Q_g	V_{DS}=480V, I_D=49.6 A, V_{GS}=10V		172		nC
Gate-Source Charge	Q_{gs}			40		nC
Gate-Drain Charge	Q_{gd}			83		nC
Maximum Continuous Body-Diode Forward Current	I_S				80	A
Maximum Pulsed Body-Diode Forward Current	I_{SM}				248	A
Diode Forward Voltage	V_{SD}	V_{GS}=0V, I_S=49.6A		0.92		V
Reverse recovery charge	Q_{rr}	V_{DS}=400V, I_F=49.6A di/dt=100A/μS		1291		nC
Reverse recovery time	T_{rr}			177		ns
Peak Reverse Recovery Current	I_{rrm}			13.7		A

Notes:
1. The max drain current rating limited by package and maximum junction temperature
2. Repetitive Rating: Pulse width limited by maximum junction temperature
3. L=23mH, VDD=150V, IAS=12A, RG=25Ω . Starting TJ=25℃, guarantee by design
4. Mount on minimum PCB layout

Typical Characteristics

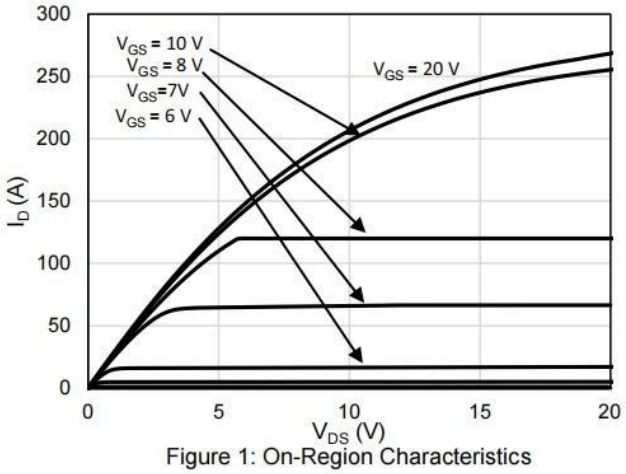


Figure 1: On-Region Characteristics

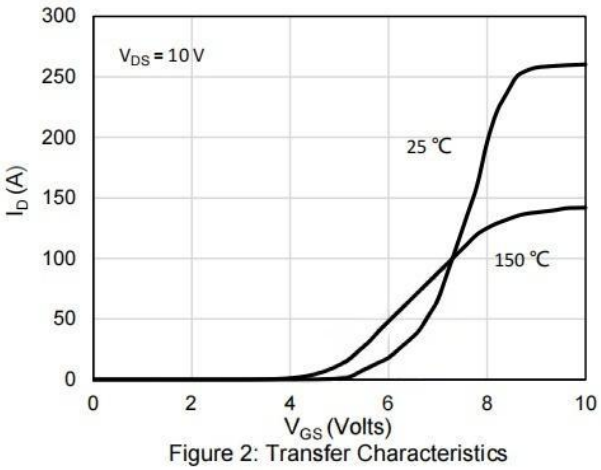


Figure 2: Transfer Characteristics

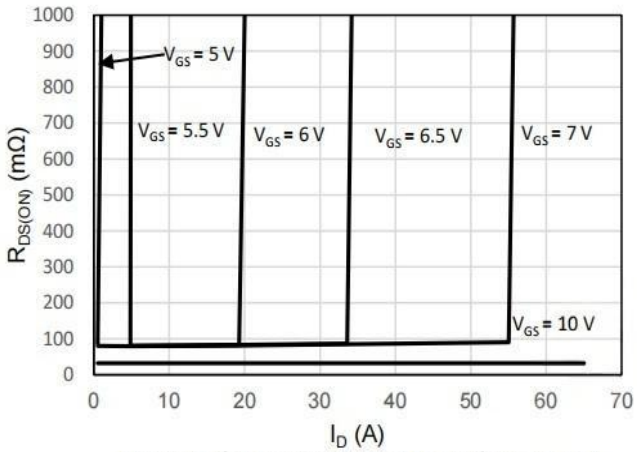


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

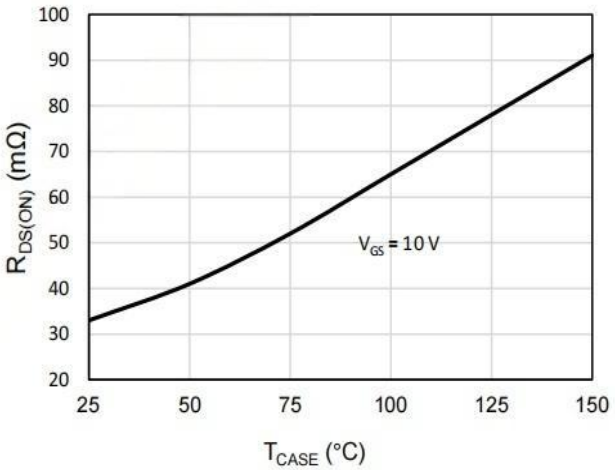


Figure 4: On-Resistance vs. T_{CASE}

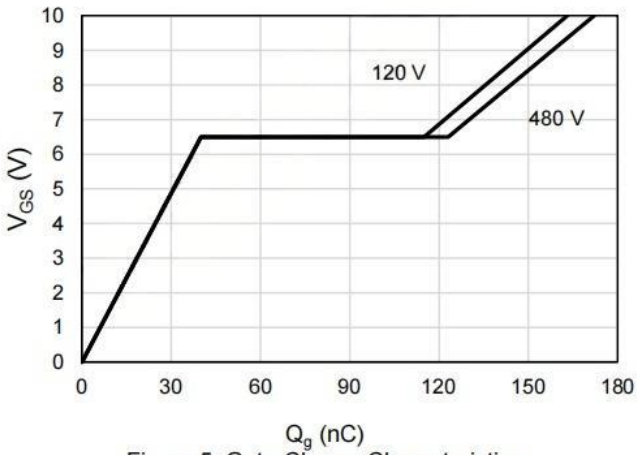


Figure 5: Gate-Charge Characteristics

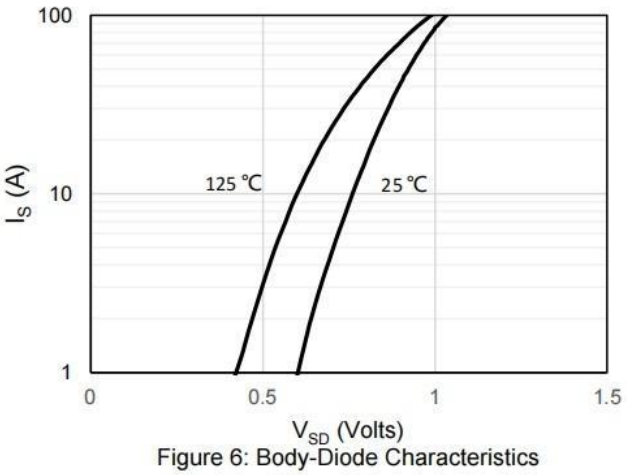


Figure 6: Body-Diode Characteristics

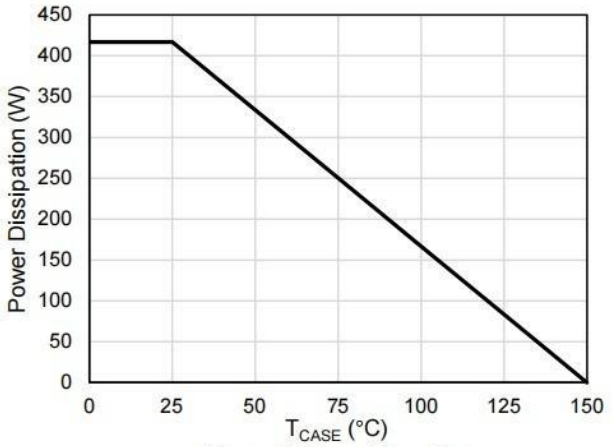


Figure 7: Power De-rating

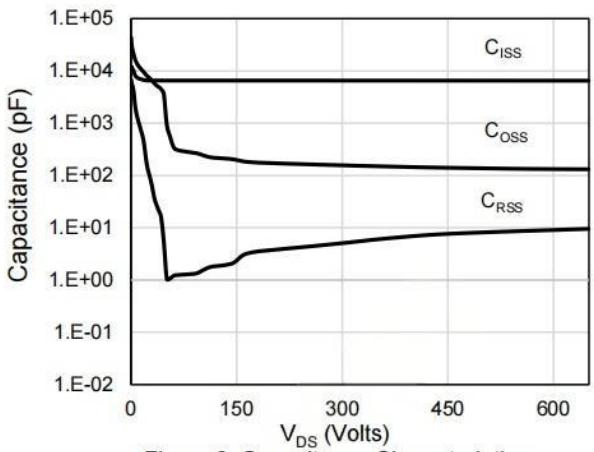


Figure 8: Capacitance Characteristics

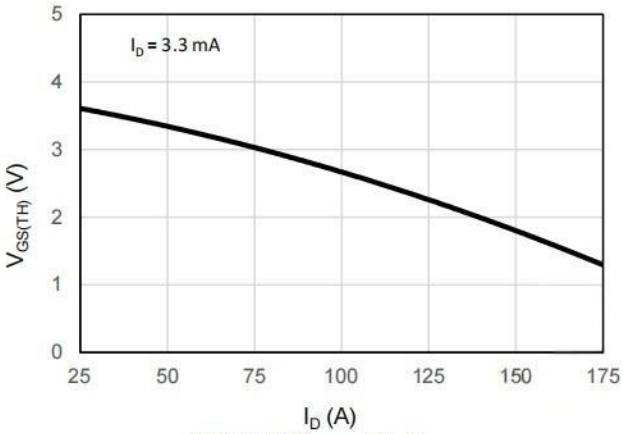


Figure 9: $V_{GS(TH)}$ vs. T_{CASE}

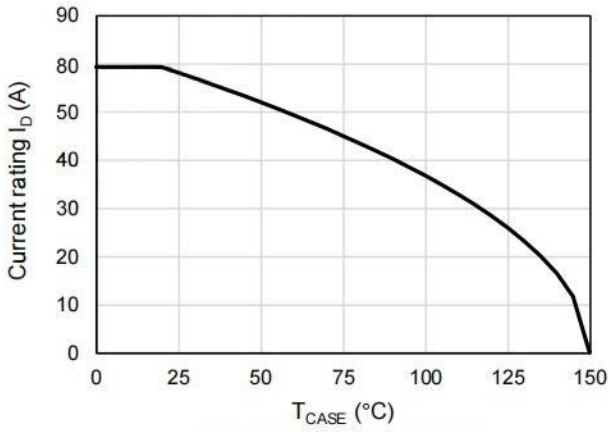


Figure 10: Current De-rating

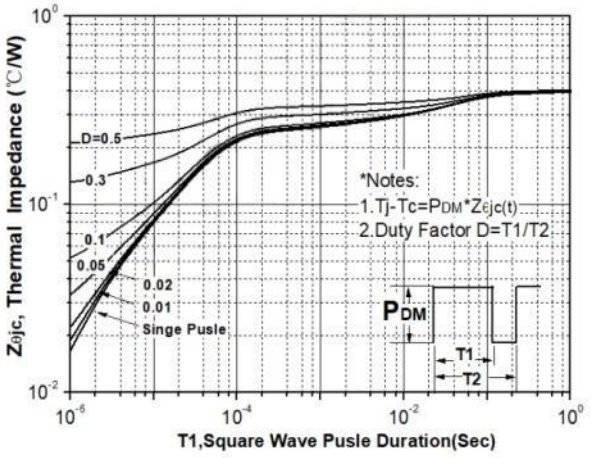


Figure 11: Transient Thermal Resp

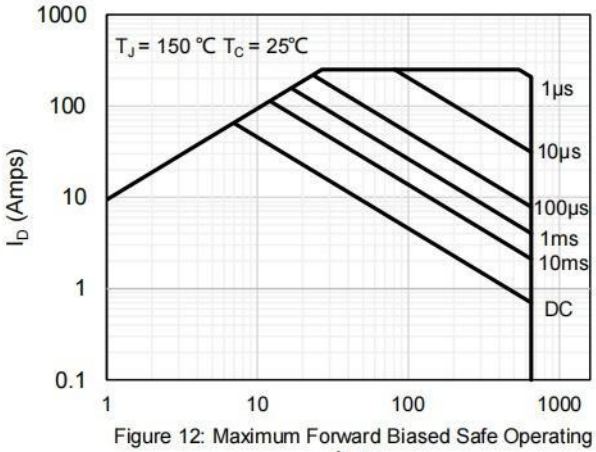
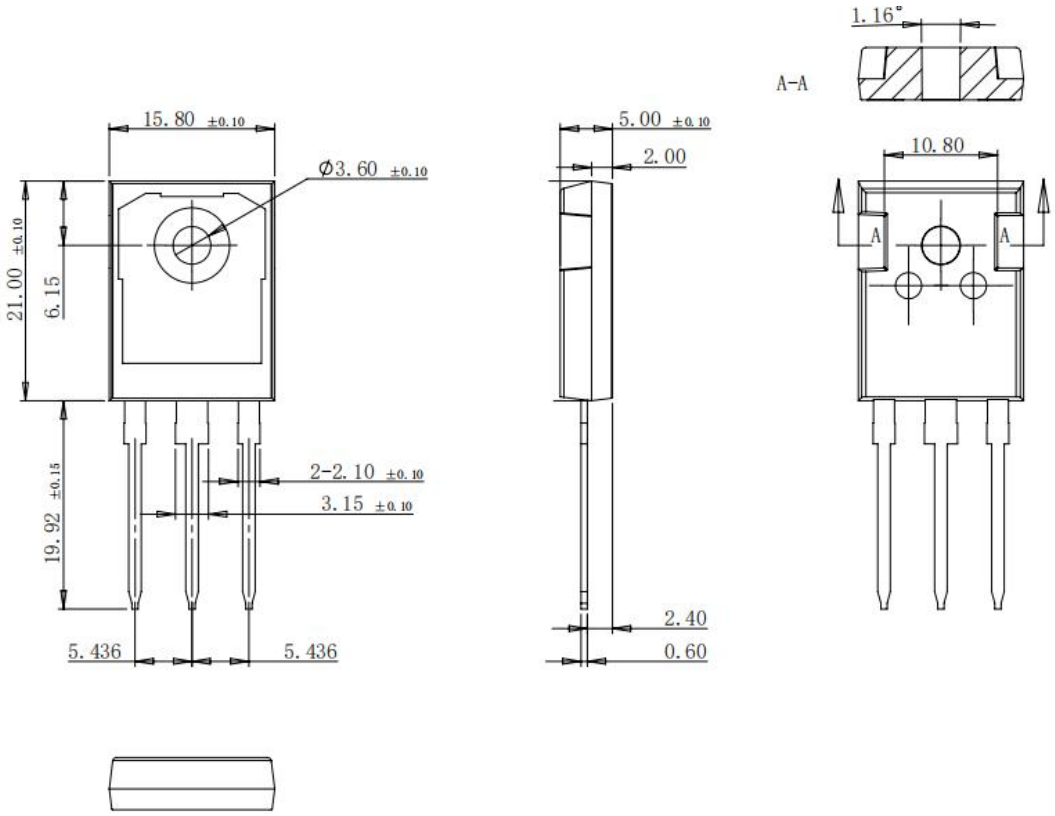


Figure 12: Maximum Forward Biased Safe Operating Area

Package Outline

TO-247-3



***Important Usage Information and Disclaimer**

The specifications of Zhuhai Hypersemi Co., Ltd. products are not guarantees of product characteristics. They reflect typical performance expected in standard applications, which may vary with specific uses. Users must conduct prior testing for their applications and make necessary adjustments.

Users are responsible for the safety of applications utilizing our products and must implement adequate safety measures to prevent physical injury, fire, or other risks in case of product failure. It is the user's duty to ensure that application designs comply with all applicable laws and standards. Our products must not be used in any applications where a product failure could reasonably result in personal injury, unless specifically authorized in a signed document by Zhuhai Hypersemi Co., Ltd.

No representations or warranties are made regarding the accuracy or completeness of this information, including any claims of non-infringement of third-party intellectual property rights. Zhuhai Hypersemi Co., Ltd. assumes no liability for any applications or uses of its products and does not grant any licenses to its intellectual property rights or those of others. We also make no claims regarding non-infringement of third-party intellectual property rights that may arise from applications.

Due to technical requirements, our products may contain hazardous substances. For details, please contact your nearest sales office. This document replaces all previous information and may be updated. We reserve the right to make changes.